

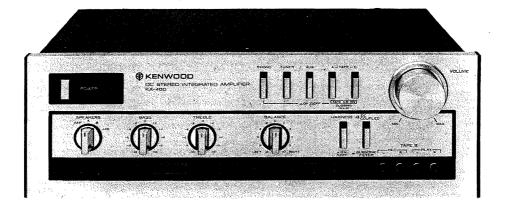
SERVICE MANUAL

KA-400

An item of adjustment is written in three languages — English, French and German.

Un article sur réglages est écrit en trois langues, Anglais, Français et Allemand.

Ein Artikel der Abgleich wird auf drei Sprachen, Englische, Französisch und Deutsch geschrieben.



DC STEREO INTEGRATED AMPLIFIER

KA-400

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Note

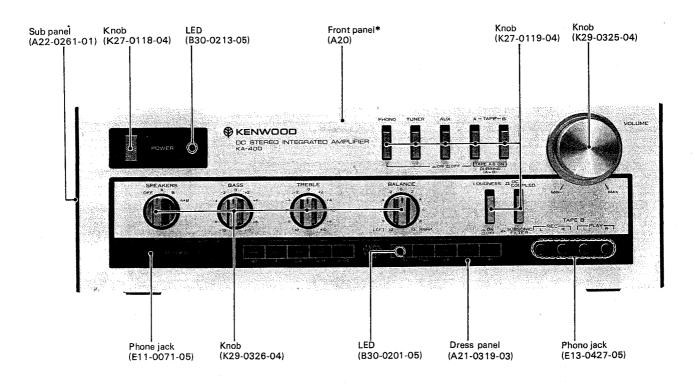
Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the U.S(K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

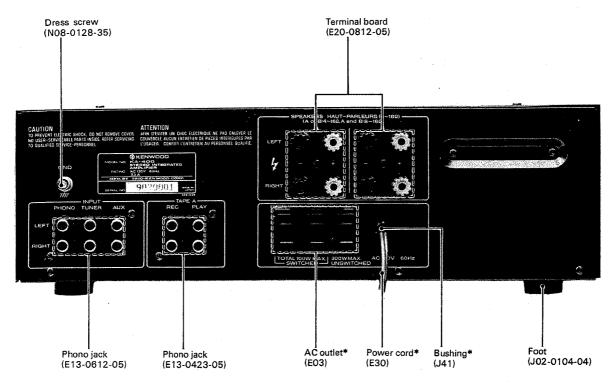
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PX	. U
Australia	. X
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South Africa	
Other Areas	M

There is no plan for producing units of S types.



EXTERNAL VIEW

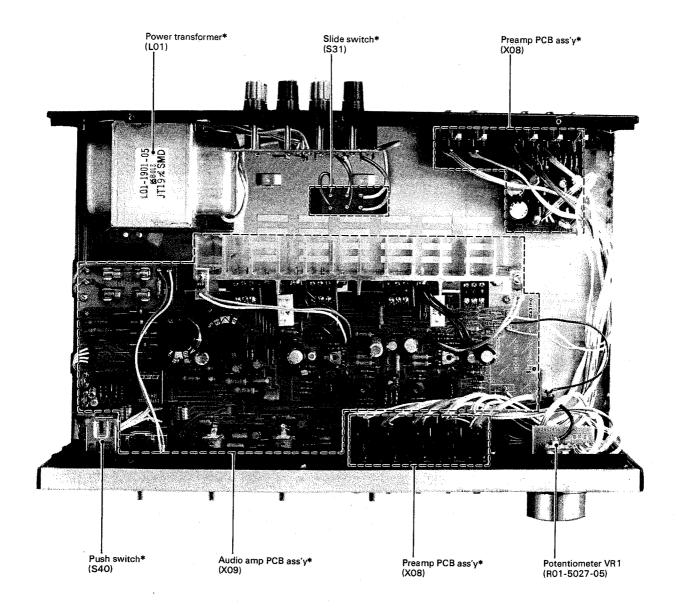




^{*} Refer to parts list.



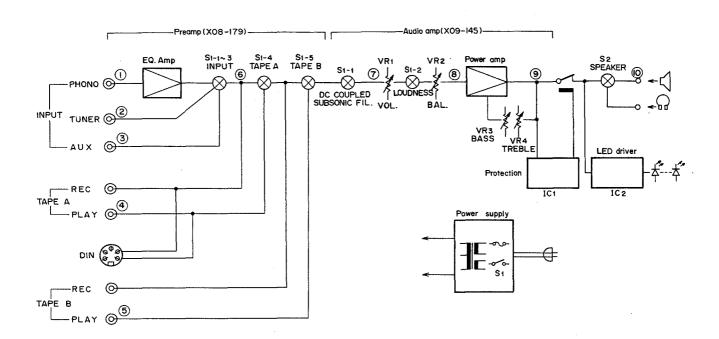
INTERNAL VIEW



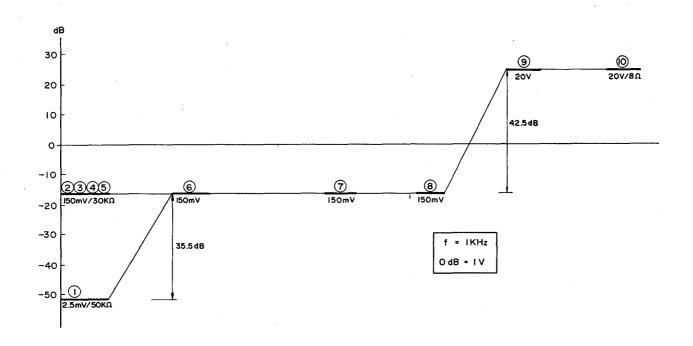


BLOCK AND LEVEL DIAGRAM

BLOCK DIAGRAM



LEVEL DIAGRAM





CIRCUIT DESCRIPTION

NON-SWITCHING CIRCUIT

Generally, power amplifiers are designed to operate in class B so that a high efficiency can be obtained. However, transistor amplifiers operated other than in class A cause the switching distortion and crossover distortion.

The crossover distortion is caused when a small signal is amplified in the nonlinear input /output characteristics range of a class B push-pull amplifier.

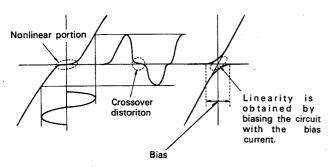


Fig. 1 Crossover distortion

The signal distortion due to the nonlinear amplification is called the crossover distortion, and it can be eliminated by biasing the circuit with the bias current so as the amplifier operates like that of class AB.

The switching distortion is caused by the delay of the switching operation of a transistor pair used in a class B push-pull amplifier.

The output stage of a power amplifier is, generally, connected in SEPP mode.

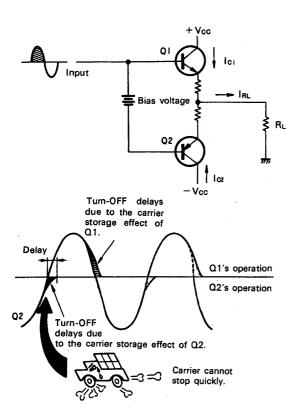
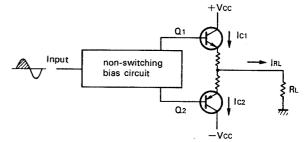


Fig. 2 Switching distortion

In figure 2, when an alternating signal is applied to the input, Q1 turns ON and Q2 is cut OFF in the positive half cycle; conversely, Q1 is cut OFF and Q2 turns ON in the negative half cycle. However, switching of conduction from Q1 to Q2, and vice versa, is not smooth because of the carrier storage effect

Assuming that the input signal makes a transition from negative to positive, the Q1 turns ON immediately according to the input signal. However, the Q2 is not cut off immediately due to the carrier storage effect. The Q1 is already conducting a large current when the Q2 is completely cut off. This situation is also identical for a transition from positive to negative.

A non-switching amplifier reduces the distortion due to the carrier storage effect by conducting a current even through the OFF side transistor.



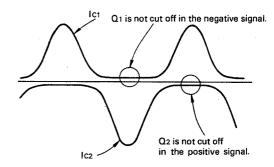


Fig. 3 Non-switching amplifier

The following figure shows the basic circuit diagram of KA-400 power amplifier.

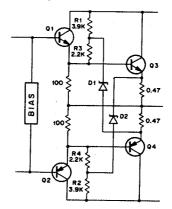


Fig. 4 Basic circuit diagram of KA-400, power amplifier

CIRCUIT DESCRIPTION

Transistors Q1 and Q2 are the drivers, and Q3 and Q4 are power transistors. Zener diodes D1 and D2, having the zener voltage of 14V, make up the non-switching bias circuit together with resistors R1 through R4. Assuming a conventional class B power amplifier, when a positive signal is input, Q1 and Q3 turn ON and Q2 and Q4 are cut off. However, in the present circuit, Q4 is not cut off since it is biased through R2, R4 and D2. Similarly, when a negative signal is input, Q3 is not cut off since it is biased through R1, R3 and D1. This operation is further explained by the following figure.

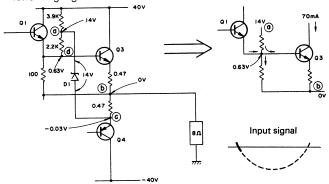
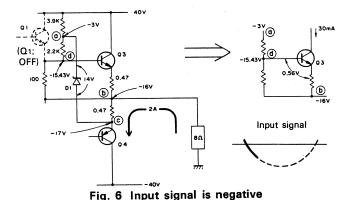


Fig. 5 Input signal goes from positive to negative

At the time when the input signal voltage goes from positive to negative ① (**Fig. 8**), the driver transistor Q1 is conducting a collector current and the zener diode D1 is also in active to produce 14V at point ⓐ . A part of the Q1's emitter current and a current from point a through the resistor are supplied to the base of the power transistor Q3 as a bias current. Then Q3's collector current will be approximately 70 mA.



The above figure shows the states of the circuit when the input signal is negative ② (**Fig. 8**) and the Q4's collector current is 2A. Since ② ampered flows through the 8-ohm resistor, the voltage at point b becomes -16V.

Most of this current flows through the emitter resistor of Q4, making -17V at point © . The voltage at point ⓐ is higher than that of point ⓒ by 14V which is the zener voltage of D1, thus resulting in the point ⓐ voltage at -3V. At this time, Q1 is cut off, and the voltage at point ⓓ is -15.43V which is the difference of voltages at points ⓐ and ⓑ divided by resistors of 2.2 k Ω and 100Ω .

Now, let's examine the operation of transistor Q3 referring to

the voltages at points (a) through (d). The base-emitter voltage VBE of Q3 is 0.56V (see **Fig. 5, 6** and **7**), thus the Q3 is not cut off. The Q3's collector current will be about 30 mA, which is reduced from the initial 70 mA.

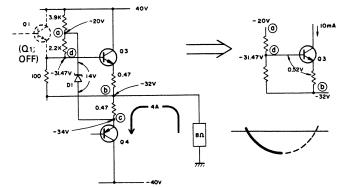
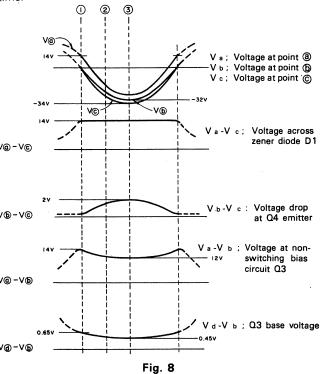


Fig. 7 Input signal is more negative

When the signal voltage becomes larger in negative ③ (**Fig. 8**), the voltage drop accross the Q4's emitter resistor increases, resulting in a reduction of Q3's VBE. Thus the collector current further decreases to become about 10 mA, but the Q3 will never be cut off. The following figure shows the voltage of various points in the circuit in relative to the time.



The behavior of power transistor Q4 with a positive output signal is identical with the operation of Q3 for a negative output, as explained above. Thus, power transistors Q3 and Q4 are not cut off in any case, and the switching distortion by carrier strage effect is reduced. In the actual circuit, a thermistor is connected between the bases of Q1 and Q2, in order to prevent the over-driving of Q3 and Q4 when the ambient temperature rises.

DISASSEMBLY FOR REPAIR

AUDIO AMP PC BOARD ASS'Y

1. Detach the bottom plate (B) from (A) using a cutter.

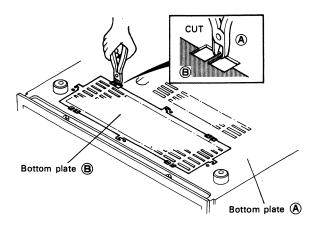
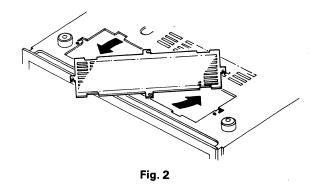


Fig. 1

2. Turn the bottom plate (B) 180° as shown.



3. Attach the bottom plate (B) with screw as shown.

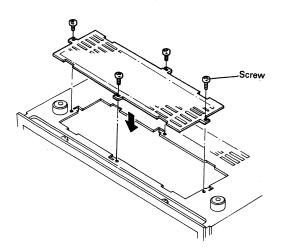
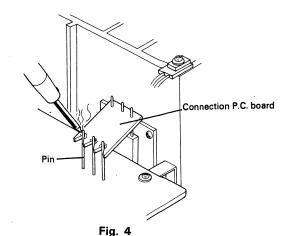


Fig. 3

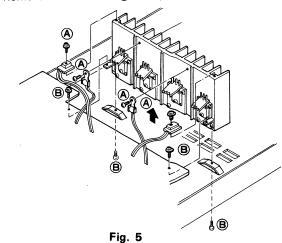
POWER TRANSISTOR

1. Unsolder twelve pins from connection P.C. board.



2. Remove four screws (A) on the heat sink.

Remove four screws (B) fixing the heat sink.



- 3. Remove the defective transistor from heat sink (B)
- **4.** Paint thermal compound on the heat sink (B) where a new transistor is to be mounted.
- 5. Mount a new transistor on the heat sink (B)

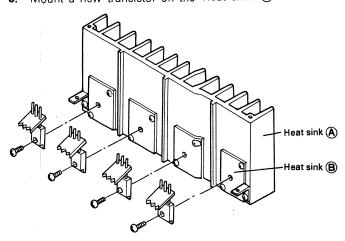


Fig. 6



ADJUSTMENT/RÉGLAGES/ABGLEICH

1. POWER AMP OFFSET VOLTAGE ADJUSTMENT

- 1. Connect the DC voltmeter between the positive and negative speaker terminals.
- Adjust the trimming pot VR7 (VR8) for a OV reading of the DC voltmeter.

1. RÉGLAGE DE LA TENSION DE DECALAGE (OFFSET)

- Brancher le voltmètre de c.c. aux bornes de sortie + et -.
- 2. Régler le potentiomètre ajustable VR7 (VR8) pour que la tension de sortie soit nulle.

1. OFFSET-SPANNUNG DER ENDVERSTÄRKER

- 1. Den Gleichspannungsmesser zwischen den Lautsprecherklemmen + und der endverstärker anschließen.
- Die Regelstange durch das Unterplattenloch einführen und den halbeingebetteten Widerstand VR7 (VR8) so regulieren, daß die Gleichspannungsmesser-Ablesung OV ist

2. BIAS CURRENT ADJUSTMENT

- 1. Turn the volume control knob fully counterclockwise.
- 2. Connect the DC voltmeter between the adjusting points and (2 and 4) of audio amp pc board ass'y (X09-145).
- 3. Adjust the BIAS CURRENT trimming pot VR5 (VR6), for a 70 mV reading of the voltmeter.

2. RÉGLAGE DU COURANT DE POLARISATION

- 1. Tourner le bouton de commande de volume à fond dans le sens invers de celui des aiguilles d'une montre.
- 2. Brancher le voltmètre de c.c. aux points d'alignment,

 et ③ (② et ④), sur la plaque circuit imprimè d'ampli de puissance (X09-145).
- 3. Réguler le potentiomètre ajustable VR5 (VR6) de façon à ce que le voltmètre de c.c. indique 70 mV.

2. LEERLAUFS

- 1. Den Lautstärkeregler (VOLUME) drehen um die Leistungsverstärker-Aufnahme auf Null zu reduzieren.
- 2. Den Gleichspannungsmesser zwischen der Regulierungs-Punkte 1 und 3 (2 und 4) der endverstärker anschließen.
- Den halbeingebetteten Widerstand VR5 (VR6) der Leistungsverstärker so regulieren, daß die GleichspannungsmesserAblesung 70 mV ist.

3. PEAK POWER LEVEL INDICATIOR ADJUSTMENT

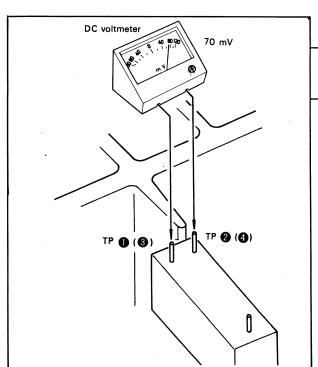
- Connect an AG and dummy load to Aux jack and speaker terminal respectively.
- 2. Connect an AC voltmeter across the dummy load.
- 3. Set the AG to 1 kHz and its output for a 5.6V reading of the AC voltmeter.
- 4. Adjust the trimming pot. VR9 (VR10) so that the 4 LEDs (for 0.004, 0.04, 0.4 and 4) light.

3. REGLAGE DU "PEAK POWER LEVEL"

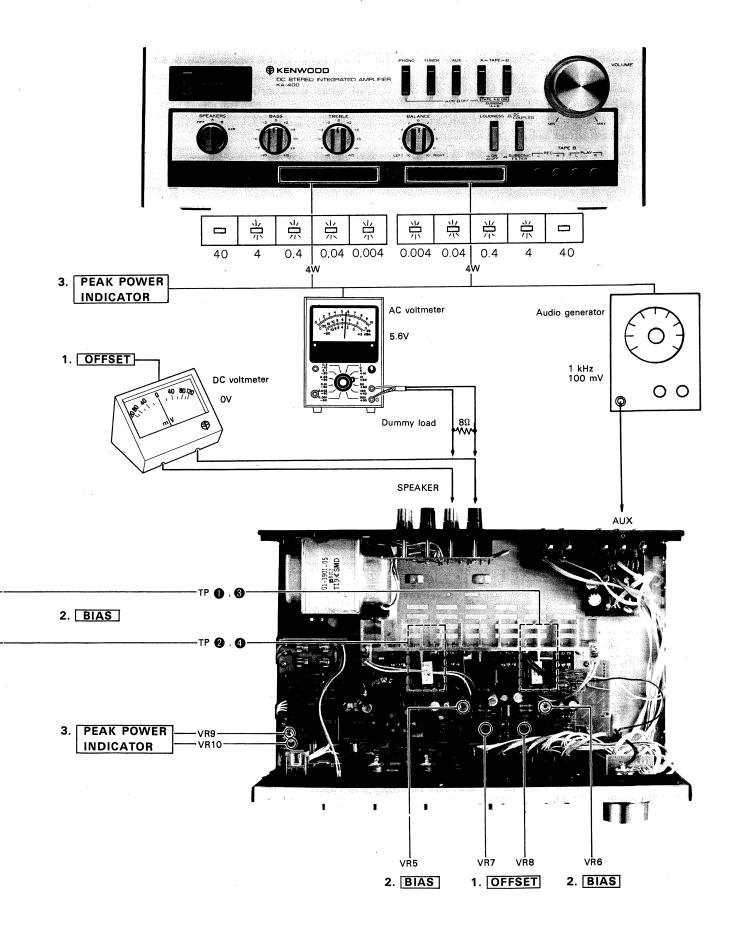
- Relier un AG (générateur de signaux audio) sur les prises Aux et une fausse charge (Resistance) sur les bornes de haut-parleir.
- 2. Relier un voltmètre aux deux extrémités de la resistance (ou aux borne de sortie + et -).
- 3. Journer le potentiomètre d'AG et d'ampli en sortie que un voltmètre indique 5,6V.
- 4. Régler le potentiomètre adjustable VR9 (VR10) en sortie que les 4LEDs (0,004, 0,04, 0,4 et 4W) allument.

3. PEGELEINSTELLUNG DES "PEAK POWER LEVEL" INDIKATOR

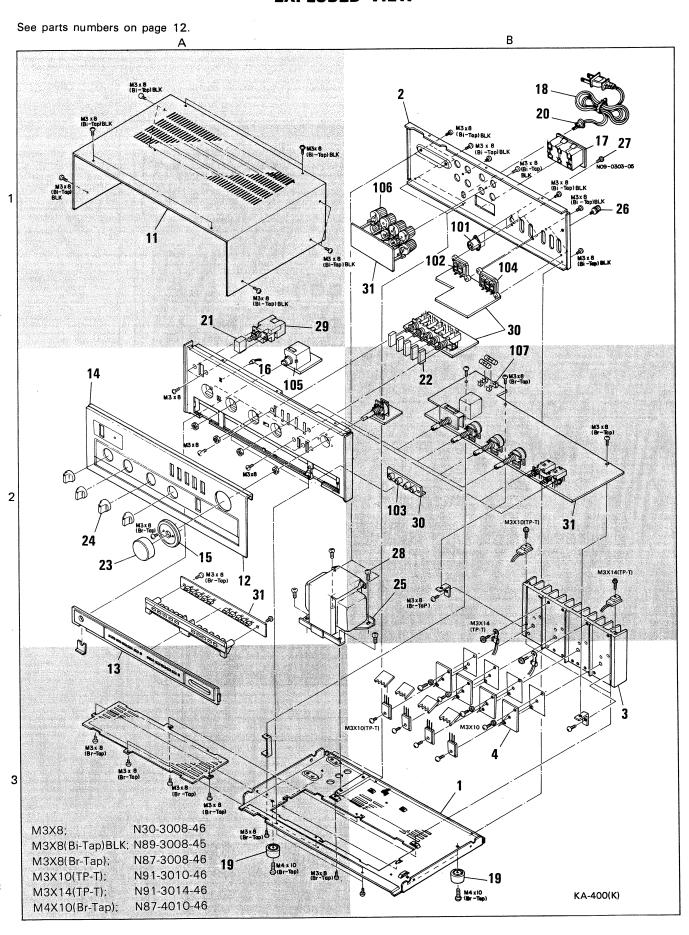
- 1. Einen AG (NF-Signalgenerator) an die AUX-Buchsen und eine kunstliche Last (8Ω 100W order mehr) an die Lautsprecher-Anschlüsse anschließen.
- Einen Wechselestrom-Voltmeter über die künstliche Last anschliessen.
- Den AG auf 1 kHz einstellen. Die Lautstärke regler (oder den AG-Ausgang) so einstellen, daß Votmeter 5,6V anzeigt.
- Das Trimme-Potentiometer VR9 (VR10) so einstellen, daß die 4 LEDs (für 0,004, 0,04, 0,4 und 4) leuchten auf.



ADJUSTMENT/RÉGLAGES/ABGLEICH

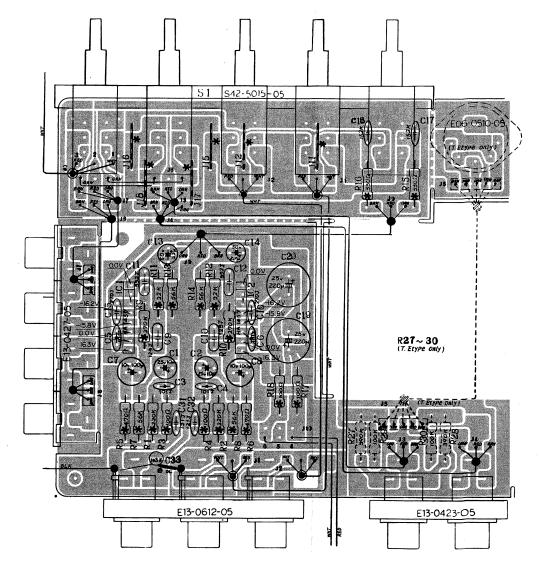


EXPLODED VIEW



PC BOARD (1)

PREAMP PCB ASS'Y (X08-1790-80, 2-71) (Component side)



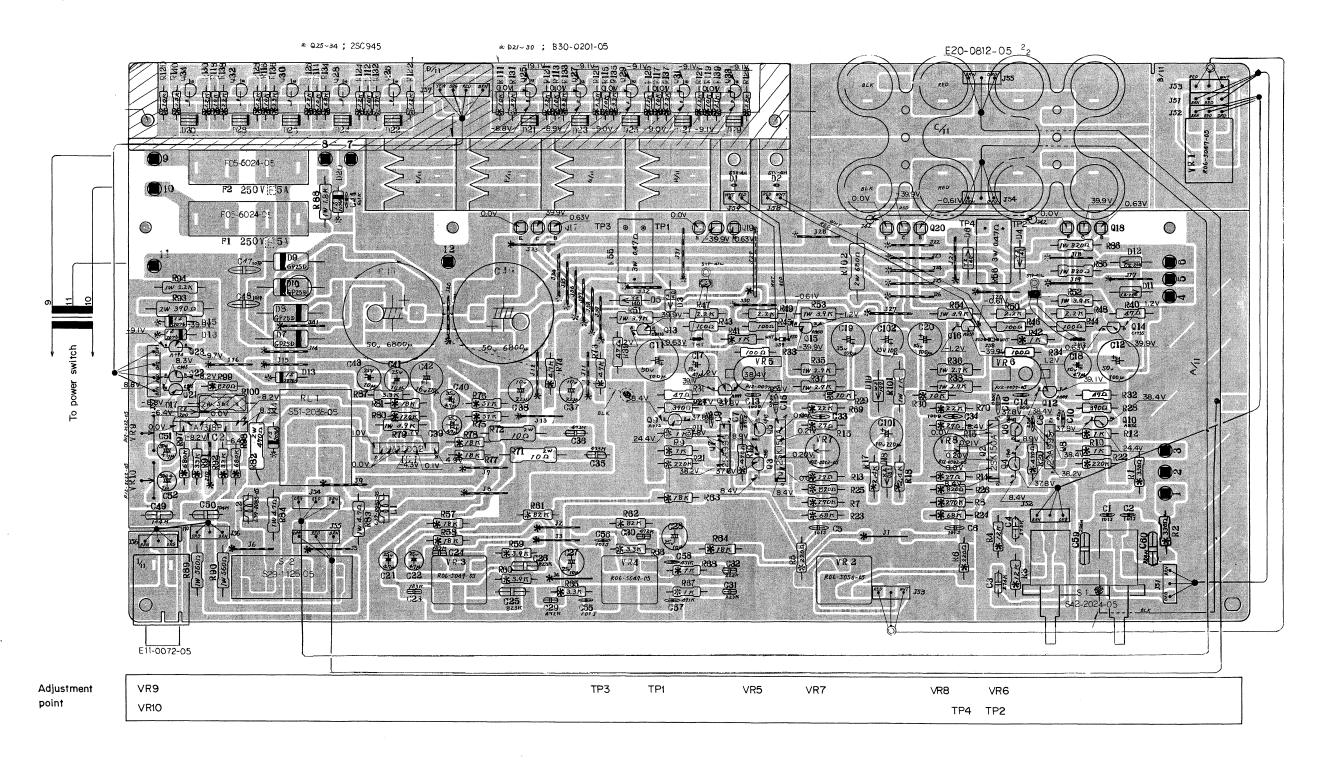
IC1,2; HA1457





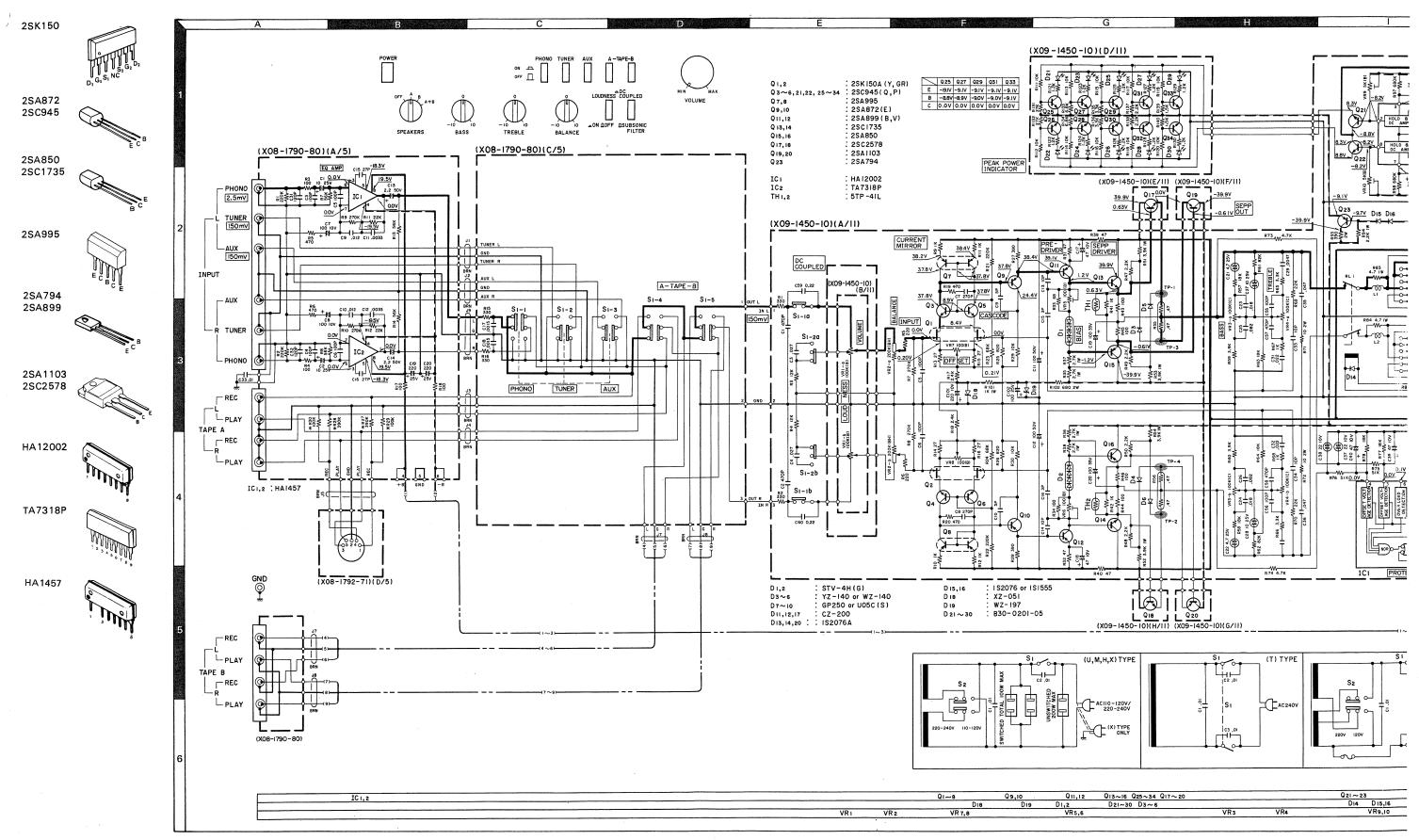
PC BOARD (2)

AUDIO AMP PCB ASS'Y (X09-1450-10, 0-81, 2-71) (Component side)



Q1, 2 : 2SK150A (Y, GR) Q3~6,21,22, 25~34 : 2SC945 (Q, P)	Q13, 14 : 2SC17 Q15, 16 : 2SA85 Q17, 18 : 2SC25	D3 \sim 6 : YZ-140 or WZ-140	D19	: XZ-051 : WZ-197
Q7, 8 : 2SA995	Q17, 18 : 2SC25 Q19, 20 : 2SA11		D21 ~ 30	: LED (B30-0201-05)
Q9, 10 : 2SA872 (E) Q11, 12 : 2SA899 (B, V)	Q23 : 2SA79	D13, 14, 20: 1S2076A D15, 16 : 1S2076 or 1S1555	IC1 IC2	: HA12002 : TA7318P





Ref. No.

C33 ,34 C35 ,36 C37 ,38

c39 ,40

C45 ,46 C47 ,48 C49 ,50 C51 ,52 C55 ,56

C57 ,58 C59 ,60

C101 C102

105 2A 106 2B

F1 ,2 F1 ,2 F1 ,2 F1 ,2

107 2B

L1 ,2

R27 ,28

R31 ,32 R33 ,34

R35 -38

R39 ,40

R47 -50 R51 -54

R71 .72

R83 ,84 R85 ,86

R89 490

R79

R82

R88

R94 R100

R101

R102

VR2 VR3 ,4

VR5 .6

VR7 .8

03 -6

RL1

\$1 \$2

VR9 ,10

C 43

C44

参照番号

Parts No.

部品番号

C46-1722-36 C71-1710-02 C46-1747-37

c26-1022-67

c24-1047-61

C90-0366-05

PARTS LIST

See instructions at the end of parts list.

R	ef. No.	Parts No.	Description	Re- marks
*	照番号	部品番号	部品名/規格	備考
		TOTAL	T	T
1 2	3 B 1 B	-	MAIN CHASSIS REAR PANEL	
11 12 12 12	1 A 2 A 2 A 2 A 2 A	A01-0366-03 A20-1557-02 A20-1557-02 A20-1557-02 A20-1557-02	METALLIC CABINET FRONT PANEL FRONT PANEL FRONT PANEL FRONT PANEL	*K PU MX E
12 13 14	2 A 3 A 2 A	A20-1558-02 A21-0319-03 A22-0261-01	FRONT PANEL DRESSING PANEL SUB PANEL	* T *
-		B46-0055-20 B46-0060-00 B46-0061-20 B46-0062-20 B46-0063-13	WARRANTY CARD WARRANTY CARD WARRANTY CARD WARRANTY CARD WARRANTY CARD	P T K U
-		B46-0064-10 B50-3076-00 B50-3076-00 B50-3077-00 B50-3077-00	WARRANTY CARD INSTRUCTION MANUAL INSTRUCTION MANUAL INSTRUCTION MANUAL INSTRUCTION MANUAL	X + K U + P M X
- 15 16	2 A 2 A	B50-3078-00 B50-3079-00 B59-0018-00 B07-0300-04 B30-0213-05	INSTRUCTION MANUAL INSTRUCTION MANUAL INSTRUCTION PRINT ESCUTCHEON LED	*T *E U
C1 C1 C1	-3 ,2 ,2	C54-3310-39 C91-0023-05 C91-0023-05 C91-0079-05	CERAMIC 0.01UF P CERAMIC 0.01UF AC250V CERAMIC 0.01UF AC250V CERAMIC 0.01UF AC125V	TE UM X KP
17 17 17 18	1 B 1 B 1 B 1 B	E03-0007-05 E03-0007-05 E03-0009-05 E30-0181-05 E30-0185-05	AC OUTLET AC OUTLET AC OUTLET POWER CORD POWER CORD	KU MX P KP X
18 18 18	1 B 1 B 1 B	E30-0459-05 E30-0545-05 E30-0587-05	POWER CORD POWER CORD POWER CORD	E UM T
-		F09-0033-05	CAPACITOR COVER	TE
-		H01-3111-04 H01-3111-04 H01-3111-04 H01-3112-04 H01-3113-04	CARTON BOX CARTON BOX CARTON BOX CARTON BOX CARTON BOX CARTON BOX	*K UM X *P *E
-		H01-3114-04 H10-1544-02 H20-0417-04 H20-0452-04 H25-0078-04	CARTON BOX POLYSTYRENE FIXTURE COVER COVER 450x230x350 BAG 235x315	*T M
19 20 20 20 20	3 A , 3 B 1 B 1 B 1 B 1 B	J02-0104-04 J41-0024-15 J41-0033-05 J41-0034-05 J41-0034-05	FOOT BUSHING BUSHING BUSHING BUSHING	XT E KP UM
21 22 23 24	1 A 2 B 2 A 2 A	K27-0118-04 K27-0119-04 K29-0325-04 K29-0326-04	KNOB (POWER) KNOB (INPUT.TAPE) KNOB (VOLUME) KNOB (TONE,BAL.)	
25	2 B	L01-2061-05	POWER TRANSFORMER	* K

Re	f. No.	F	Parts	No.	Description	Re- mark
*	照番号	部	品	番号	部品名/規格	備考
25 25 25 25 25 25	2 B 2 B 2 B 2 B 2 B	L01	-200 -200	52-05 55-05 55-05 56-05 57-05	POWER TRANSFORMER POWER TRANSFORMER POWER TRANSFORMER POWER TRANSFORMER POWER TRANSFORMER	*T *U MX *E *P
26 27 28	1 B 1 B 2 B	N09	-03(28=35 03=05 22=05	DRESSED SCREW (GND) SCREW (M3X6) SCREW (M4X8)	TE
- 29 29 29	1 A 1 A .1 A	\$31 \$40 \$40	-20: -20: -20:	53-05 53-05 74-05 74-05 75-05	SLIDE SWITCH (V.SEL.)S2 SLIDE SWITCH (V.SEL.)S2 PUSH SWITCH (POWER) S1 PUSH SWITCH (POWER) S1 PUSH SWITCH (POWER) S1	UM XE UM X TE
29	1 A	s40-	-208	35-05	PUSH SWITCH (POWER) S1	KP
30 30 30 30 30	18,28 18,28 18,28 18,28 18,28	X08- X08- X08-	-179 -179 -179	90-80 90-80 90-80 92-71 90-10	PRE AMP PCB ASSY PRE AMP PCB ASSY PRE AMP PCB ASSY PRE AMP PCB ASSY AUDIO AMP PCB ASSY	KP UM X TE *K
31 31 31 31 31	18,28 18,28 18,28 18,28 18,28	X09 X09 X09	-145 -145 -145	50-10 50-81 50-81 52-71	AUDIO AMP PCB ASSY AUDIO AMP PCB ASSY AUDIO AMP PCB ASSY AUDIO AMP PCB ASSY AUDIO AMP PCB ASSY	P *U MX *T E
	Р	REA	MF	(X08	179)	<u> </u>
C1 C3 C7 C9	,2 -6 ,8 ,10 ,12	C71. C24. C46.	-171 -101 -171	10-67 10-15 10-71 12-35 33-25	LL-ELEC 10UF 25WV CERAMIC 100PF J ELECTRO 100UF 10WV MYLAR 0.012UF J MYLAR 0.0033UF J	
c13 c15 c17 c19 c31	,14 ,16 ,18 ,20 ,32	C71.	-172 -171 -142	22-51 27-05 15-26 22-71 12-15	ELECTRO 2.2UF 50WV CERAMIC 27PF J CERAMIC 0.0015UF K ELECTRO 220UF 25WV CERAMIC 120PF J	
C 3 3		c 5 5 •	-171	0-38	CERAMIC 0.01UF Z	
101 102 103 104	18 18 28 18	E13.	-042 -042	10-05 23-05 27-05 12-05	REC/PLAY JACK (DIN) PHONO JACK (TAPE A) PHONO JACK (TAPE B) PHONO JACK (INPUT)	TE
I C 1		<u> </u>		54 - 10	HA1457	
7		JDIC) A	MP (X	09-145) HEAT SINK (A)	1
4	2 B	-			HEAT SINK (A)	
D 2 1	- 30	в30-	-020	1-05	LED	
C1 C3 C5 C7 C9	,2 ,4 ,6 ,8 ,10	C46- C71- C71-	-172 -173 -173	7-15 27-36 10-15 27-15 05-01	CERAMIC 470PF J MYLAR 0.027UF K CERAMIC 100PF J CERAMIC 270PF J CERAMIC 5PF C	
C11 C13 C15 C17	,12 ,14 ,16 ,18 ,20	C71	-17' -17' -10'	10-71 10-02 03-01 47-61 10-71	ELECTRO 100UF 50WV CERAMIC 10PF D CERAMIC 3PF C ELECTRO 47UF 10WV ELECTRO 100UF 35WV	
C21 C23 C25 C27	,22 ,24 ,26 ,28	C46	-17' -17'	47-57 18-36 82-36 10-67	NP-ELEC 4.7UF 25WV MYLAR 0.018UF K MYLAR 0.082UF K NP-ELEC 10UF 25WV	

	Re- marks 備考	
	*T *U MX *E *P	
	TE	
2 2 1 1 1 1	UM XE UM X TE KP	
•	KP UM X TE	
	P *U MX *T E	
	ΤE	

Re-	Ref. No.	Parts No.	Description	Re-
marks 備考	参照番号	部品番号	部品名/規格	mark 備考
	D7 -10 D11 /12	V11-0465-05 V11-4104-70	GP25D CZ=200	
	D13 ,14 D15 ,16	V11-0273-05 V11-0271-05	152076A 152076	
	017	V11-4104-70	C z = 200 X z = 051	
	D19 D20	V11-4100-30 V11-0273-05	WZ-197 152076A	
	101	V30-0291-10 V30-0292-10	HA12002 TA7318p	
	Q1 ,2 Q3 -6	V09-0137-40 V03-0348-05	25K150A(Y,GR) 25C945(Q,P)	
	Q7 ,8 Q9 ,10 Q11 ,12	V01-0995-00 V01-0189-05 V01-0199-05	2SA995 2SA872(E) 2SA899(B,V)	
	Q13 ,14	V03-0452-05	2801735	
	Q15 ,16 Q17 ,18 Q19 ,20	V01-0173-05 V03-2578-00 V01-1103-00	2sA850 2sC2578 2sA1103	
	Q21 ,22	V03-0348-05	2sc945(Q,P)	
UM	Q23 Q25 -34 TH1 ,2	V01-0794-00 V03-0348-05 V22-0027-05	2SA794 2SC945(Q/P) 5TP-41L	
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PARTS LIST

Description

部品名/規格

10 W V

10 W V

16WV 25WV

50WV

50WV

25 W V

J 2E

J ZE

J 3D J 3A

J 3A

J 30

J 3A

250V 6A 250V 6A 250V 6A

250VF 6.3A

MYLAR 0.0047UF K

MYLAR 0.022UF K

CERAMIC 10PF MYLAR 0.047UF

NP-ELEC 22UF

ELECTRO 47UF

ELECTRO 6800UF

C24-1410-61 ELECTRO 10UF C24-1222-71 ELECTRO 220UF C24-1410-61 ELECTRO 10UF

C52-1756-16 | CERAMIC 560PF

C54-2710-39 CERAMIC 0.01UF C46-1710-47 MYLAR 0.1UF C24-1710-51 ELECTRO 1UF

C71-1710-15 | CERAMIC 100PF

C52-1747-16 | CERAMIC 470PF

C46-1722-47 MYLAR 0.22UF C24-1022-71 ELECTRO 220UF C24-1410-71 ELECTRO 100UF

E20-0812-05 TERMINAL BOARD (SPEAKER)

FL-PROOF RD390 FL-PROOF RD47

FL-PROOF RD47

R43-1210-15 FL-PROOF RD100 J 2E R43-1222-25 FL-PROOF RD2.2K J 2E R47-5439-25 FL-PROOF RS3.9K J 3A

FL-PROOF RS2.7K

CEMENT 0.47X2

FL-PROOF RS470 FL-PROOF RS4.7 FL-PROOF RS820

FL-PROOF RS560

FL-PROOF RS390

FL-PROOF RS1K

FL-PROOF RS680

R12-0502-05 TRIMMING POT. 100 R12-2022-05 TRIMMING POT. 5K

\$29-11-25-05 ROTARY WAFER SWITCH

FL-PROOF RS1.8K

FL-PROOF RS10 J 3D

FL-PROOF RS3.9K J 3A

FL-PROOF RS2.2K J 3A FL-PROOF RS560 J 3D

POTENTIOMETER (VOLUME)
POTENTIOMETER (BALANCE)
POTENTIOMETER (TONE)

TRIMMING POT. 100

E11-0072-05 | PHONE JACK

J13-0055-05 | FUSE HOLDER

R43-1210-15 | FL-PROOF RD100

F05-6021-05 FUSE F05-6021-05 FUSE F05-6024-05 FUSE

F05-6322-05 FUSE

L39-0085-05 COIL

R43-1239-15 R43-1247-05

R47-5427-25

R43-1247-05

R90-0128-05

R47-5510-05

R47-5439-25

R47-5547-15 R47-5447-95

R47-5482-15

R47-5418-25

R47-5456-15

R47-5539-15

R47-5422-25 R47-5556-15

R47-5410-25

R47-5568-15

R06-5047-05

R06-5049-05

R12-0077-05

\$51-2038-05 RELAY

\$42-2024-05 PUSH SWITCH

V11-5100-40 STV-4H(G)

V11-0254-05 YZ-140

INSTR

	Ref. No.
②—————————————————————————————————————	-18 1A 19 2A 19 2A 19 2A 19 2A
5 —	R221 R222 VR1 ,2 VR3 ,4 VR5 ,6

Exploded vi Position in Symbol of Area to wh parts No. c USA).

When this (same parts

(5) Reference 1

(6) Abbreviation

capacitors and Abbreviation

* Abbreviation ELECTRO . LL-ELEC ... NP-ELEC ... MICA POLYSTY ... MYLAR ... CERAMIC TANTAL ... MF

FL-PROOF I RW FL-PROOF I RN FUSE-RESIS 2B



Re-marks 備考

*T *U MX *E *P

TE

UM XE UM X

ΚP

KP UM X TE

*U MX *T E

ΤE

PARTS LIST

Ref. No.	Parts No.	Description	Re- mark
参照番号	部品番号	部品名/規格	備考
C29 ,30 C31 ,32 C33 ,34 C35 ,36 C37 ,38	C46+1747-26 C46-1722-36 C71-1710-02 C46-1747-37 C26+1022-67	MYLAR 0.0047UF K MYLAR 0.022UF K CERAMIC 10PF D MYLAR 0.047UF M NP-ELEC 22UF 10WV	
C39 ,40 C41 C42 C43 C44	c24-1047-61 c24-1410-61 c24-1222-71 c24-1410-61 c52-1756-16	ELECTRO 47UF 10WV ELECTRO 10UF 25WV ELECTRO 220UF 16WV ELECTRO 10UF 25WV CERAMIC 560PF K	
C45 ,46 C47 ,48 C49 ,50 C51 ,52 C55 ,56	C90-0366-05 C54-2710-39 C46-1710-47 C24-1710-51 C71-1710-15	ELECTRO 6800UF 50WV CERAMIC 0.01UF P MYLAR 0.1UF M ELECTRO 1UF 50WV CERAMIC 100PF J	
C57 ,58 C59 ,60 C101 C102	C52-1747-16 C46-1722-47 C24-1022-71 C24-1410-71	CERAMIC 470PF K MYLAR 0.22UF M ELECTRO 220UF 10WV ELECTRO 100UF 25WV	
105 2A	E11-0072-05	PHONE JACK	
106 2B	E20-0812-05	TERMINAL BOARD (SPEAKER)	
F1 ,2	F05-6021-05	FUSE 250V 6A	UM
F1 ,2	F05-6021-05	FUSE 250V 6A	X
F1 ,2	F05-6024-05	FUSE 250V 6A	KP
F1 ,2	F05-6322+05	FUSE 250V 6.3A	TE
107 2B	J13-0055-05	FUSE HOLDER	
L1 ,2	L39-0085-05	COIL	
R27 ,28	R43-1239-15	FL-PROOF RD390 J 2E	
R31 ,32	R43-1247-05	FL-PROOF RD47 J 2E	
R33 ,34	R43-1210-15	FL-PROOF RD100 J 2E	
R35 -38	R47-5427-25	FL-PROOF RS2.7K J 3A	
R39 ,40	R43-1247-05	FL-PROOF RD47 J 2E	
R43 -46	R43-1210-15	FL-PROOF RD100 J 2E	*
R47 -50	R43-1222-25	FL-PROOF RD2.2K J 2E	
R51 -54	R47-5439-25	FL-PROOF RS3.9K J 3A	
R55 ,56	R90-0128-05	CEMENT 0.47X2 3F	
R71 ,72	R47-5510-05	FL-PROOF RS10 J 3D	
R79	R47-5439-25	FL-PROOF RS3.9K J 3A	
R82	R47-5547-15	FL-PROOF RS470 J 3D	
R83 ,84	R47-5447-95	FL-PROOF RS4.7 J 3A	
R85 ,86	R47-5482-15	FL-PROOF RS820 J 3A	
R88	R47-5418-25	FL-PROOF RS1.8K J 3A	
R89 490	R47-5456-15	FL-PROOF RS560 J 3A	
R93	R47-5539-15	FL-PROOF RS590 J 3D	
R94	R47-5422-25	FL-PROOF RS2,2K J 3A	
R100	R47-5556-15	FL-PROOF RS560 J 3D	
R101	R47-5410-25	FL-PROOF RS1K J 3A	
R102	R47-5568-15	FL-PROOF RS680 J 3D	*
VR1	R06-5047-05	POTENTIOMETER (VOLUME)	
VR2	R06-5050-05	POTENTIOMETER (BALANCE)	
VR3 ,4	R06-5049-05	POTENTIOMETER (TONE)	
VR5 ,6	R12-0077-05	TRIMMING POT. 100	
VR7 .8	R12=0502=05	TRIMMING POT. 100	
VR9 .10	R12=2022=05	TRIMMING POT. 5K	
RL1	\$51-2038-05	RELAY	*
\$1	\$42-2024-05	PUSH SWITCH	
\$2	\$29-11-25-05	ROTARY WAFER SWITCH	
D1 ,2	v11-5100-40	STV-4H(G)	
D3 =6	v11-0254-05	YZ-140	

Ref. No.	Parts No.	Description	Re-
参照番号	部品番号	部品名/規格	mark 備考
D7 +10 D11 ,12 D13 ,14 D15 ,16	V11-0465-05 V11-4104-70 V11-0273-05 V11-0271-05 V11-4104-70	GP25D Cz-200 1s2076A 1s2076 Cz-200	
D18 D19 D20 IC1 IC2	V11-4103-60 V11-4100-30 V11-0273-05 V30-0291-10 V30-0292-10	XZ-051 WZ-197 1S2076A HA12002 TA7318p	
Q1 ,2 Q3 -6 Q7 ,8 Q9 ,10 Q11 ,12	V09-0137-40 V03-0348-05 V01-0995-00 V01-0189-05 V01-0199-05	2SK150A(Y,GR) 2SC945(Q,P) 2SA995 2SA872(E) 2SA899(B,V)	
Q13 ,14 Q15 ,16 Q17 ,18 Q19 ,20 Q21 ,22	V03-0452-05 V01-0173-05 V03-2578-00 V01-1103-00 V03-0348-05	2SC1735 2SA850 2SC2578 2SA1103 2SC945(Q,P)	
Q23 Q25 -34 TH1 ,2	V01-0794-00 V03-0348-05 V22-0027-05	2SA794 2SC945(Q.P) 5TP-41L	
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INSTRUCTION FOR PARTS LIST

Ref. No.	Parts No.	Description	Re- marks
参照番号	* 4 * 9	部品名/規格	常考
)			#
	A01-0608-12	METALLIC CABINET	· K
19 2A	A20-1979-11	FRONT PANEL ASSY	PM
19° 2A	A20-1979-11	FRONT PANEL ASSY	SU
19 2A		PRUNI PANEL ASSI	
R221	R43-1333-15	FL-PROOF RD330 J 2H	
R222 VR1 42	R43-1368-15 R12-3301-05	FL-PROOF RD680 J 2H TRIMMING POT. 20K(B)	1.
VR3 ,4	R19-4305-05	POTENTIOMETER (OUTPUT)	
VR5 .6	R12-2302-05	TRIMMING POT. 5K(B)	

- Exploded view drawing No.
- Position in exploded view.
- Symbol of new parts.
- Area to which parts are shipped. Example: A20-1979-11 is the parts No. of FRONT PANEL ASS'Y for the "K" type products (for USA).

When this column is blank, it means that the same type of parts (same parts No.) are used for the products shipped to all areas.

- S Reference No. in schematic diagram.
- Abbreviation of "Flame proof metal oxide film resistor". All capacitors and resistors are listed using abbreviations.
- 7 Abbreviations
- * Abbreviations of capacitors (Parts No. with initial letter "C"). Electrolytic capacitor LL-ELEC. Low leak electrolytic capacitor Non-pole electrolytic capacitor NP-ELEC. Mica capacitor MICA . POLYSTY Polystyrene capacitor Mylar capacitor MYLAR Ceramic capacitor CERAMIC TANTAL. Tantalum capacitor Metallized film capacitor MF Oil capacitor OIL . The unit "UF" is used in lieu of " μ F"
- Abbreviations of resistors (Parts No. with initial letters "R"). . Carbon composition resistor Carbon film resistor RD. FL-PROOF RD . Flame-proof carbon film resistor Wire wound power resistor RW Flame-proof metal oxide film resistor FL-PROOF RS... Metal film resistor RN. Resistor with fuse function FUSE-RESIST Rated wattage 1/8W Rated wattage 1/4W 2H Rated wattage 1/2W Rated wattage 1W 3D 2W Rated wattage 3W Rated wattage Rated wattage 3G Rated wattage 5W All resistor values are indicated with the unit (Ω) omitted.
- * Abbreviations common to capacitors and resistors.

C	±0.25pF (Used for capacitors only)
D	±0.5pF (Used for capacitors only)
F	±1%
G	±2%
J	±5%
Κ	±10%
M	±20%
Z	+80%, -20% (Used for capacitors only)

+ 100%, -0% (Used for capacitors only) Resistors RD (carbon composition resistors) are not listed in the parts list. For values, refer to the schematic diagram. A product of

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